EXHIBIT B-2

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```
/*
 *----------------------------------------------------------------------
 *
 * computeHash --
 *
 *  Compute the MD5 hash for the specified string, returning the hash as
 *  a 32-character hex string.
 *
 * Results:
 *      Pointer to static hash string.
 *
 * Side effects:
 *      None.
 *----------------------------------------------------------------------
 */
static char *computeHash(char *str)
{
    int i;
    MD5_CTX md5;
    unsigned char hash[16];
    static char hashstr[33];
    char *q;

    MD5Init(&md5);
    MD5Update(&md5, (unsigned char *) str, strlen(str));
    MD5Final(hash, &md5);
    q = hashstr;
    for(i=0; i<16; i++) {
        sprintf(q, "%02x", hash[i]);
        q += 2;
    }
    *q = '\0';
    return hashstr;
}
```

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```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_ParseTicket --
 *
 *      Called by dorequest, before any region commands or mount handlers
 *      have run. We parse and handle incomeing sid's and tickets.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *
 *----------------------------------------------------------------------
 */

int TICKET_ParseTicket(HTTP_Request *reqPtr)
    {
    int status = HT_OK;

    IncTicketCounter(CountTotalUrl);

    status = ParseSid(reqPtr);
    if (TicketGlobalData(EnableTicket) && (status == HT_OK)) status = ParseTicke
    return status;
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * ParseSid --
 *
 *      Called by TICKET_ParseTicket, before any region commands or mount handle
 *      have run. We parse and handle incomeing sid's.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *
 *----------------------------------------------------------------------
 */

int ParseSid(HTTP_Request *reqPtr)
    {
    TICKET_Request *ticketPtr;
    HTTP_Server *serverPtr;
    DString hash;
    int i;
    char *cp, *cp1;
    int *bsid=NULL, act_hash;
    unsigned int cur_tim, tdif, exp_tim;
    char *secret;
    char temp_str[512];
    char *hashP;
    int sid_ok = 0;
    unsigned char *ecp;
    unsigned int eda;
    int endian = 1;
    int ip1,ip2,ip3,ip4;


    /* fetch the server private ticket extension data */
    /* note that this sets up a default ticket block for both SID's and Ticket a
    serverPtr = reqPtr->serverPtr;
    ticketPtr = (TICKET_Request *) HT_GetReqExtData(reqPtr, TicketServerData.tic
    ASSERT (ticketPtr == NULL);

    ticketPtr = (TICKET_Request *) Malloc(sizeof(TICKET_Request));
    HT_AddReqExtData(reqPtr, TicketServerData.ticketExtensionId, ticketPtr, free
    DStringInit(&ticketPtr->rawUrl);
    DStringInit(&ticketPtr->sid);
    DStringInit(&ticketPtr->fields);
    DStringInit(&ticketPtr->signature);
    DStringInit(&ticketPtr->ticketIP);
    ticketPtr->valid     = 0;
    ticketPtr->sidDom    = -1;
    ticketPtr->ticketDom = -1;
    ticketPtr->ticketExp = -1;
    ticketPtr->uid       = 0;
    ticketPtr->uctx      = 0;
    sscanf(DStringValue(&reqPtr->remoteAddr), "%d.%d.%d.%d", &ip1, &ip2, &ip3, &
    ticketPtr->uid = (((ip1+ip2)<<24) | ((ip3+ip4)<<16) | (rand() & 0xFFFF));
    ticketPtr->uctx  = 1;
```

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```
/* we are done if sids are not enabled, or this url does not have a sid */
if (!(TicketGlobalData(EnableSid))) return HT_OK;
cp1 = DStringValue(&reqPtr->url);
if (strstr(cp1, SID_prefix) != cp1)
  return HT_OK;
if (strlen(cp1) == sidLength)
  {
  DStringAppend(&reqPtr->url, "/", -1);
  DStringAppend(&reqPtr->path, "/", -1);
  cp1 = DStringValue(&reqPtr->url);
  }
cp = strchr(cp1+sizeof(SID_prefix),'/');
if ((cp - cp1) != sidLength)
  return HT_OK;
IncTicketCounter(CountSidUrl);


DStringInit(&hash);

/* if sid eater is enabled, rewrite the url without the sid, and reprocess t
if (TicketGlobalData(EnableSidEater))
  {
  DStringAppend(&hash, DStringValue(&reqPtr->url), -1);
  DStringFree(&reqPtr->url);
  DStringAppend(&reqPtr->url, DStringValue(&hash)+sidLength, -1);
  DStringTrunc(&hash, 0);
  DStringAppend(&hash, DStringValue(&reqPtr->path), -1);
  DStringFree(&reqPtr->path);
  DStringAppend(&reqPtr->path, DStringValue(&hash)+sidLength, -1);
  DStringFree(&hash);
  IncTicketCounter(CountDiscardedSidUrl);
  return HT_OK;
  }


DStringAppend(&ticketPtr->sid,  DStringValue(&reqPtr->url), sidLength);

/* first convert the SID back to binary*/
i = DStringLength(&ticketPtr->sid)-3;
bsid = (int *) radix64decode_noslash(DStringValue(&ticketPtr->sid)+3, i, &i)
if ((bsid == NULL) || (i != 12)) goto rtn_exit;

fix_endian(&bsid[0], ecp, eda);
fix_endian(&bsid[1], ecp, eda);
fix_endian(&bsid[2], ecp, eda);

/* check the SID version field */
if (get_sid(rev_lw,rev_pos,rev_mask) != sid_rev_zero) goto sid_bad;
if (get_sid(rsrv1_lw,rsrv1_pos,rsrv1_mask) != 0) goto sid_bad;
if (get_sid(rsrv2_lw,rsrv2_pos,rsrv2_mask) != 0) goto sid_bad;

/* Get a pointer to the secret */
secret = GetSecret(get_sid(kid_lw,kid_pos,kid_mask));
if (secret == NULL) goto sid_bad;

 /* hash the sid and check the signature */
DStringAppend(&hash, secret, -1);
```

```
.DStringAppend(&hash, DStringValue(&reqPtr->remoteAddr), -1);
 sprintf(temp_str, "%08x%08x", bsid[2],bsid[1]);
 DStringAppend(&hash, temp_str, -1);
 /* format of the hash string is %s%s%08x%08x", secret,ip_addr,bsid[2],bsid[1

 hashP = DStringValue(&hash);
 act_hash = compute_ihash(hashP);
 while (*hashP != 0) *hashP++ = 0;


 fix_endian(&act_hash, ecp, eda);
 if (act_hash != get_sid(sig_lw,sig_pos,sig_mask)) goto  sid_bad;


 /* is is ok, may be expired, but good enough to id user */
 ticketPtr->uid = get_sid(uid_lw,uid_pos,uid_mask);
 ticketPtr->uctx = get_sid(uctx_lw,uctx_pos,uctx_mask);

 /* do the SID experation processing */
 cur_tim = (time(0)>>exp_shft_amt) & exp_mask;
 exp_tim = get_sid(exp_lw,exp_pos,exp_mask);
 tdif = (exp_tim - cur_tim) & 0xffff;
 if (tdif > 0x7fff)
   {
   IncTicketCounter(CountExpSid);
   goto sid_exp;
   }

 /* sid is fine, save the sid state, update the url's */
 ticketPtr->sidDom = get_sid(dom_lw,dom_pos,dom_mask);
 ticketPtr->valid = 1;
 sid_ok = 1;
 IncTicketCounter(CountValidSid);

sid_bad:
 if (!(sid_ok)) IncTicketCounter(CountInvalidSid);
sid_exp:
 DStringAppend(&ticketPtr->rawUrl, DStringValue(&reqPtr->path), -1);
 DStringTrunc(&reqPtr->path, 0);
 DStringAppend(&reqPtr->path, DStringValue(&ticketPtr->rawUrl)+sidLength, -1)

 DStringTrunc(&ticketPtr->rawUrl, 0);
 DStringAppend(&ticketPtr->rawUrl, DStringValue(&reqPtr->url), -1);
 DStringTrunc(&reqPtr->url, 0);
 DStringAppend(&reqPtr->url, DStringValue(&ticketPtr->rawUrl)+sidLength, -1);

rtn_exit:
 DStringFree(&hash);
 if (bsid != NULL) free(bsid);
 return HT_OK;
 }
```

```
/*
 *----------------------------------------------------------------------
 *
 * freeTicketReqData
 *
 *       This routine frees the storage used by ticket specific request
 *       data.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Memory freed.
 *
 *----------------------------------------------------------------------
 */

static void freeTicketReqData(void *dataPtr)
    {
    TICKET_Request *ticketPtr = dataPtr;
    DStringFree(&ticketPtr->rawUrl);
    DStringFree(&ticketPtr->sid);
    DStringFree(&ticketPtr->fields);
    DStringFree(&ticketPtr->signature);
    DStringFree(&ticketPtr->ticketIP);
    free(ticketPtr);
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * GetSecret --
 *
 *      Given a binary keyID, returns an ascii secret from the
 *      secrets store.
 *      for untranslatable names, return NULL.
 *
 * Results:
 *      "I've got a secret, now you do too"
 *
 * Side effects:
 *
 *
 *----------------------------------------------------------------------
 */

char *GetSecret(int kid)
    {
    HashEntry *entryPtr;

    entryPtr = FindHashEntry(&TicketServerData.SecretsKid, (void *) kid);
    if(entryPtr == NULL) return NULL;
    return DStringValue((DString *)GetHashValue(entryPtr));
    }
```

```
/*
 *----------------------------------------------------------------------
 *
 * GetKidByKeyID --
 *
 *      Given an ascii  KeyID return the binary KeyID.
 *      for untranslatable names, return -1.
 *
 * Results:
 *      "I've got a secret, now you do too"
 *
 * Side effects:
 *
 * .
 *----------------------------------------------------------------------
 */

int GetKidByKeyID(char *keyID)
    {
    HashEntry *entryPtr;

    entryPtr = FindHashEntry(&TicketServerData.KeyID, (void *) keyID);
    if(entryPtr == NULL) return -1;
    return (int) GetHashValue(entryPtr);
    }
```

```
/*
 *----------------------------------------------------------------------
 *
 * fieldParse --
 *
 *  Given a string, a separator character, extracts a field up to the
 *  separator into the result string.
 *  Does substitution on '%XX' sequences, and returns the pointer to the
 *  character beyond last character in '*endptr'.
 *
 * Results:
 *      Returns a malloc'ed string (caller must free), or NULL if an
 *      error occurred during processing (such as an invalid '%' sequence).
 *
 * Side effects:
 *      None.
 *
 *----------------------------------------------------------------------
 */
#define SIZE_INC 200
static char *fieldParse(char *str, char sep, char **endptr)
{
    char buf[3];
    char c;
    char *end, *data, *p;
    int maxlen, len;

    len = 0;
    maxlen = SIZE_INC;
    p = data = malloc(maxlen);

  /*
   * Loop through string, until end of string or sep character.
   */
    while(*str && *str != sep) {

        if(*str == '%') {
            if(!isxdigit(str[1]) || !isxdigit(str[2])) {
                free(data);
                return NULL;
            }
            buf[0] = str[1];
            buf[1] = str[2];
            buf[2] = '\0';
            c = strtol(buf, &end, 16);
            str += 3;
        } else if(*str == '+') {
            c = ' ';
            str++;
        } else
            c = *str++;

        *p++ = c;
        len++;
        if(len >= maxlen) {
            maxlen += SIZE_INC;
            data = realloc(data, maxlen);
            p = data + len;
        }
```

```
    }
    *p++ = '\0';
    *endptr = str;
    return data;
}
```

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```
/*
 *----------------------------------------------------------------------
 *
 * DomainNameCmd --
 *
 *      A call to this routine, builds the ascii domain name
 *      to binary domain name maping structure for a numeric domain.
 *      Syntax is Domain number name1 name2 name3 name... name_last
 *      At least one name is required. The number is decimal and
 *      can be any value except -1. -1 is reserved as a marker
 *      for untranslatable names.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Commands are validate, and entries added to the map
 *
 *----------------------------------------------------------------------
 */

static int DomainNameCmd(ClientData clientData, Tcl_Interp *interp,
                         int argc, char **argv)
    {
    int new,i;
    HashEntry *entryPtr;
    int DomNumber;
    DString DomName;


    if (argc <3)
      {
      Tcl_AppendResult(interp, argv[0], " directive:  wrong number of "
                "arguments, should be \"3\"",
                (char *) NULL);
      return TCL_ERROR;
      }

    DStringInit(&DomName);


    if (((sscanf(argv[1], "%d", &DomNumber) != 1) || (DomNumber == -1)))
      {
      Tcl_AppendResult(interp, argv[0], " directive:  ",
                "Domain number must be an integer, and not equal to -1",
                ", value found was ",argv[1],
                (char *) NULL);
      return TCL_ERROR;
      }

    for (i = 2; i < argc; i++)
      {
      DStringFree(&DomName);
      DStringAppend(&DomName, argv[i], -1);
      strtolower(DStringValue(&DomName));
      entryPtr = CreateHashEntry(&TicketServerData.Domains, DStringValue(&DomNam
      if (new == 0)
        {
        Tcl_AppendResult(interp, argv[0], " directive:  ",
```

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```
            "Duplicate domain name specified, '", argv[i], "'",
            (char *) NULL);
        return TCL_ERROR;
        }
      SetHashValue(entryPtr, DomNumber);
      }
    DStringFree(&DomName);
    return TCL_OK;
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * SecretsCmd --
 *
 *      A call to this routine, builds kid to secrets table
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Secrets are stored.
 *
 *----------------------------------------------------------------------
 */

static int SecretsCmd(ClientData clientData, Tcl_Interp *interp,
                      int argc, char **argv)
    {
    int newKid,newKeyID;
    HashEntry *entryPtrKid = NULL , *entryPtrKeyID = NULL;
    int Kid;
    DString *dsptrKid;


    if (argc != 4)
      {
      Tcl_AppendResult(interp, argv[0], " directive:  wrong number of "
                "arguments, should be \"4\"",
                (char *) NULL);
      return TCL_ERROR;
      }

    if (sscanf(argv[2], "%d", &Kid) != 1)
      {
      Tcl_AppendResult(interp, argv[0],
                " directive:  KeyID must be an integer",
                ", value found was '",argv[2],"'",
                (char *) NULL);
      return TCL_ERROR;
      }

    entryPtrKid = CreateHashEntry(&TicketServerData.SecretsKid, (void *) Kid, &n
    if (strlen(argv[1]))
      entryPtrKeyID = CreateHashEntry(&TicketServerData.KeyID, (void *) argv[1],
    if ((newKid == 0) || ((newKeyID == 0) && strlen(argv[1])))
      {
      Tcl_AppendResult(interp, argv[0],
                " directive:  Duplicate Secret specified for KeyID '",
                argv[1],
                (char *) NULL);
      return TCL_ERROR;
      }

    if (strlen(argv[1]))
      {
      dsptrKid = (DString *) malloc(sizeof(DString));
      DStringInit(dsptrKid);
      DStringAppend(dsptrKid, argv[3], -1);
```

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```
    SetHashValue(entryPtrKid, dsptrKid);
    }
  SetHashValue(entryPtrKeyID, Kid);
  return TCL_OK;
  }
```

```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_Initialize --
 *
 *      Calls all the necessary routines to initialize the ticket subsystem.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Commands added to the region interpreter.
 *      SID "/@@" url catcher declared.
 *
 *----------------------------------------------------------------------
 */

int TICKET_Initialize(HTTP_Server *serverPtr, Tcl_Interp *interp)
    {
    TicketServerData.ticketExtensionId = HT_RegisterExtension(serverPtr, "ticket

    InitHashTable(&TicketServerData.SecretsKid, TCL_ONE_WORD_KEYS);
    InitHashTable(&TicketServerData.KeyID,    TCL_STRING_KEYS);
    InitHashTable(&TicketServerData.Domains, TCL_STRING_KEYS);

    /* initialize Server ticket data */
    DStringInit(&TicketGlobalData(AuthServer));
    DStringInit(&TicketGlobalData(TicketExpHandler));
    DStringInit(&TicketGlobalData(TicketAdrHandler));
    TicketGlobalData(FreeArea)              = 0;
    TicketGlobalData(EnableLocalAuth)       = 0;
    TicketGlobalData(CurrentSecret)         = 0;
    TicketGlobalData(EnableSid)             = 0;
    TicketGlobalData(EnableTicket)          = 0;
    TicketGlobalData(EnableSidBater)        = 0;
    TicketGlobalData(LocalAuthExp)          = 60*30;

    /* ticket event counters */
    TicketGlobalData(CountTotalUrl)         = 0;
    TicketGlobalData(CountSidUrl)           = 0;
    TicketGlobalData(CountValidSid)         = 0;
    TicketGlobalData(CountExpSid)           = 0;
    TicketGlobalData(CountInvalidSid)       = 0;
    TicketGlobalData(CountCrossDomain)      = 0;
    TicketGlobalData(CountLocalRedirects)   = 0;
    TicketGlobalData(CountRemoteRedirects)  = 0;
    TicketGlobalData(CountNoRedirects)      = 0;
    TicketGlobalData(CountDiscardedSidUrl)  = 0;


    /* Ticket related Config commands */
    Tcl_CreateCommand(interp, "Domain",                 DomainNameCmd,
                      (ClientData) serverPtr, NULL);
    Tcl_CreateCommand(interp, "Secrets",                SecretsCmd,
                      (ClientData) serverPtr, NULL);
    Tcl_CreateCommand(interp, "AuthenticationServer", CmdStringValue,
              (ClientData) &TicketGlobalData(AuthServer), NULL);
    Tcl_CreateCommand(interp, "TicketExpirationHandler", CmdStringValue,
              (ClientData) &TicketGlobalData(TicketExpHandler), NULL);
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```
Tcl_CreateCommand(interp, "TicketAddressHandler", CmdStringValue,
          (ClientData) &TicketGlobalData(TicketAdrHandler), NULL);
Tcl_CreateCommand(interp, "FreeDomain",           CmdIntValue,
          (ClientData) &TicketGlobalData(FreeArea), NULL);
Tcl_CreateCommand(interp, "EnableSidEater",       CmdIntValue,
          (ClientData) &TicketGlobalData(EnableSidEater), NULL);
Tcl_CreateCommand(interp, "EnableSid",            CmdIntValue,
          (ClientData) &TicketGlobalData(EnableSid), NULL);
Tcl_CreateCommand(interp, "EnableTicket",         CmdIntValue,
          (ClientData) &TicketGlobalData(EnableTicket), NULL);
Tcl_CreateCommand(interp, "EnableLocalAuth",      CmdIntValue,
          (ClientData) &TicketGlobalData(EnableLocalAuth), NULL);
Tcl_CreateCommand(interp, "CurrentSecret",        CmdIntValue,
          (ClientData) &TicketGlobalData(CurrentSecret), NULL);
Tcl_CreateCommand(interp, "LocalAuthExp",         CmdIntValue,
          (ClientData) &TicketGlobalData(LocalAuthExp), NULL);

HT_AddMountHandler(serverPtr, (ClientData) NULL, TICKET_DebugHooks,
    "/omiserver", NULL);

return HT_OK;
}
```

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```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_Shutdown --
 *
 *      Calls all the necessary routines to shutdown the ticket subsystem.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Memory freed
 *
 *----------------------------------------------------------------------
 */

void TICKET_Shutdown(HTTP_Server *serverPtr)
    {
    HashEntry *entryPtr;
    HashSearch search;
    DString   *dstring;

    DStringFree(&TicketGlobalData(AuthServer));
    DStringFree(&TicketGlobalData(TicketExpHandler));
    DStringFree(&TicketGlobalData(TicketAdrHandler));

    entryPtr = FirstHashEntry(&TicketServerData.SecretsKid, &search);
    while (entryPtr != NULL)
      {
      dstring = GetHashValue(entryPtr);
      DStringFree(dstring);
      free(dstring);
      entryPtr = NextHashEntry(&search);
      }
    DeleteHashTable(&TicketServerData.SecretsKid);

    DeleteHashTable(&TicketServerData.KeyID);

    DeleteHashTable(&TicketServerData.Domains);
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_AddRegionCommands --
 *
 *      Add TICKET region commands for authentication/authorization decisions.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Commands added to the region interpreter.
 *
 *----------------------------------------------------------------------
 */

void TICKET_AddRegionCommands(HTTP_Request *reqPtr, Tcl_Interp *interp)
    {
    Tcl_CreateCommand(interp, "RequireSID", TICKET_RequireSidCmd,
                      (ClientData) reqPtr, NULL);
    Tcl_CreateCommand(interp, "RequireTicket", TICKET_RequireTicketCmd,
                       (ClientData) reqPtr, NULL);
    }
```

```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_GetCGIVariables --
 *
 *      Add TICKET CGI variables to the CGI variable table.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      Extends the CGI variable hash table.
 *
 *----------------------------------------------------------------------
 */

void TICKET_GetCGIVariables(HTTP_Request *req)
    {
    TICKET_Request *ticketPtr = (TICKET_Request *) HT_GetReqExtData(req, TicketS


    /*
     * If there's no extension data, then we're not doing a ticket.  Just return
     */

    if (ticketPtr == NULL)
        return;

    if (DStringLength(&ticketPtr->rawUrl) != 0)
      HT_AddCGIParameter(req, "TICKET_URL", DStringValue(&ticketPtr->rawUrl), FA
    if (DStringLength(&ticketPtr->sid) != 0)
      HT_AddCGIParameter(req, "TICKET_SID", DStringValue(&ticketPtr->sid), FALSE
    if (DStringLength(&ticketPtr->fields) != 0)
      HT_AddCGIParameter(req, "TICKET_FIELDS", DStringValue(&ticketPtr->fields),
    if (DStringLength(&ticketPtr->signature) != 0)
      HT_AddCGIParameter(req, "TICKET_SIGNATURE", DStringValue(&ticketPtr->signa
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_GetUrl
 *
 *      Return the original url (with sid)
 *
 * Results:
 *      The URL.
 *
 * Side effects:
 *      None.
 *
 *----------------------------------------------------------------------
 */
char * TICKET_GetUrl(HTTP_Request *reqPtr)
{
    TICKET_Request *ticketPtr;

    ticketPtr = (TICKET_Request *)
      HT_GetReqExtData(reqPtr, TicketServerData.ticketExtensionId);
    if ((ticketPtr != NULL) &&
        (DStringLength(&ticketPtr->rawUrl) != 0))
      return DStringValue(&ticketPtr->rawUrl);
    else
      return DStringValue(&reqPtr->url);
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_ConfigCheck
 *
 *      Perform late configuration checks
 *
 * Results:
 *
 *
 * Side effects:
 *      Possible message loged/printed, and program exit'd.
 *
 *----------------------------------------------------------------------
 */
void TICKET_ConfigCheck()
    {
    HashEntry *entryPtr;
    int kid;

    if ((TicketGlobalData(EnableSid) & ~0x1) != 0)
      {
      LogMessage(LOG_ERR, "EnableSid must be 0 or 1");
      exit(0);
      }

    if (!(TicketGlobalData(EnableSid))) return;

    kid = TicketGlobalData(CurrentSecret);
    if ((kid && kid_mask) != kid)
      {
      LogMessage(LOG_ERR, "CurrentSecret %d is invalid", kid);
      exit(0);
      }

    entryPtr = FindHashEntry(&TicketServerData.SecretsKid, (void *) kid);
    if(entryPtr == NULL)
      {
      LogMessage(LOG_ERR, "No secret defined for CurrentSecret %d", kid);
      exit(0);
      }

    if ((TicketGlobalData(FreeArea) & ~0x255) != 0)
      {
      LogMessage(LOG_ERR, "FreeArea must be between 0 and 255");
      exit(0);
      }

    if ((TicketGlobalData(EnableSidEater) & ~0x1) != 0)
      {
      LogMessage(LOG_ERR, "EnableSidEater must be 0 or 1");
      exit(0);
      }

    if ((TicketGlobalData(EnableTicket) & ~0x1) != 0)
      {
      LogMessage(LOG_ERR, "EnableTicket must be 0 or 1");
      exit(0);
      }
```

```
if ((TicketGlobalData(EnableLocalAuth) & ~0x1) != 0)
  {
  LogMessage(LOG_ERR, "EnablLocalAuth must be 0 or 1");
  exit(0);
  }
}
```

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```
/*
 *----------------------------------------------------------------------
 *
 * TICKET_DebugHooks
 *
 *      Check for debug hooks and execute if found.
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      None.
 *
 *----------------------------------------------------------------------
 */
static void TICKET_DebugHooks(ClientData clientData, char *suffix,
                              HTTP_Request *reqPtr)
    {
    if(strcmp(suffix, "/ticketstatus") == 0)
      {
      DumpStatus(reqPtr);
      HT_FinishRequest(reqPtr);
      return;
      }
    HTTP_Error(reqPtr, NOT_FOUND, "access denied due to poorly formed url");
    HT_FinishRequest(reqPtr);
    return;
    }
```

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```
/*
 *----------------------------------------------------------------------
 *
 * DumpStatus --
 *
 *      Dump the server's ticket stat's
 *
 * Results:
 *      None.
 *
 * Side effects:
 *      None.
 *
 *----------------------------------------------------------------------
 */
#define BUFSIZE 1024
static void DumpStatus(HTTP_Request *reqPtr)
{
    HTTP_Server *serverPtr = reqPtr->serverPtr;
    char tmp[BUFSIZE], timeStr[BUFSIZE];
    struct utsname sysinfo;
    time_t uptime;
    int hours;


    HTTP_BeginHeader(reqPtr, "200 OK");
    HTTP_SendHeader(reqPtr, "Content-type: text/html", NULL);
    HTTP_EndHeader(reqPtr);
    HTTP_Send(reqPtr, "<title>WebServer Ticket Status</title>",
                      "<h1>WebServer Ticket Status</h1>", NULL);

    HTTP_Send(reqPtr, "<p><hr><p><h2>Ticket Log</h2>","<p><pre>\n", NULL);

    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of access          ", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of SID URL's       ", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of Valid SID's     ", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of Expired SID's   ", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of Invalid SID's  . ", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of XDomain accesses", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of Local Redirects ", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of Remote Redirects", Ticket
    HTTP_Send(reqPtr, tmp, NULL);
    sprintf(tmp, "     <b>%s:  </b>  %d\n", "Number of No Auth servers ", Ticket


    HTTP_Send(reqPtr, tmp, "</pre>", NULL);


    uptime = time(NULL) - serverPtr->started;
    uname(&sysinfo);
    strftime(timeStr, BUFSIZE, "%A, %d-%b-%y %T",
        localtime(&serverPtr->started));
```

```
    sprintf(tmp, "Server running on <b>%s</b> (%s %s) port %d, has been up \
                  since %s.<p>", sysinfo.nodename, sysinfo.sysname,
                    sysinfo.release, serverPtr->server_port, timeStr);
    HTTP_Send(reqPtr, tmp, NULL);

    sprintf(tmp, "     <b>Number of connections:     </b> %d\n",
            serverPtr->numConnects);
    HTTP_Send(reqPtr, "<p><pre>\n", tmp, NULL);

    sprintf(tmp, "     <b>Number of HTTP requests:   </b> %d\n",
            serverPtr->numRequests);
    HTTP_Send(reqPtr, tmp, "</pre><p>", NULL);

    hours = max(uptime / 3600, 1);
    sprintf(tmp, "This server is averaging <b>%d</b> requests per hour.<p>",
            serverPtr->numRequests/hours);
    HTTP_Send(reqPtr, tmp, NULL);

    DumpRusage(reqPtr);
/*  DumpConnections(reqPtr); */

    DNS_DumpStats(reqPtr);

    HTTP_Send(reqPtr, "<p><hr><address>", DStringValue(&ht_serverSoftware),
            "</address>\n", NULL);


    reqPtr->done = TRUE;

}
#undef BUFSIZE
```

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```
User: morris
Host: uprism.openmarket.com
Class: uprism.openmarket.com
Job: t.t
```

What is claimed is:

1. A method of processing service requests from a client to a server system through a network, said method comprising the steps of:

forwarding a service request from the client to the server system, wherein communications between the client and server system are according to hypertext transfer protocol;

returning a session identifier from the server system to the client; and

appending as part of a path name in a uniform resource locator the session identifier to the request and to subsequent service requests from the client to the server system within a session of requests.

2. A method as claimed in claim 1 wherein the session identifier includes a user identifier.

3. A method as claimed in claim 1 wherein the session identifier includes an expiration time for the session.

4. A method as claimed in claim 1 wherein the server system records information from the session identifier in a transaction log in the server system.

5. A method as claimed in claim 4 wherein the server system tracks the access history of sequences of service requests within a session of requests.

6. A method as claimed in claim 5 wherein the server system tracks the access history to determine service requests leading to a purchase made within the session of requests.

7. A method as claimed in claim 4 wherein the server system counts requests to particular services exclusive of repeated requests from a common client.

8. A method as claimed in claim 4 wherein the server system maintains a data base relating customer information to access patterns.

9. A method as claimed in claim 8 wherein the information includes customer demographics.

10. A method as claimed in claim 1 wherein the server system assigns the session identifier to an initial service request to the server system.

11. A method as claimed in claim 1 wherein the server system subjects the client to an authorization routine prior to issuing the session identifier and the session identifier is protected from forgery.

12. A method as claimed in claim 1 wherein the server system comprises plural servers including an authentication server which provides session identifiers for service requests to multiple servers.

13. A method as claimed in claim 12 wherein:

a client directs a service request to a first server which is to provide the requested service;

the first server checks the service request for a session identifier and only services a service request having a valid session identifier, and where the service request has no valid identifier:

the first server redirects the service request from the client to the authorization server;

the authorization server subjects the client to the authorization routine and issues the session identifier to be appended to the service request to the first server;

the client forwards the service request appended with the session identifier to the first server; and

the first server recognizes the session identifier and services the service request to the client; and

the client appends the session identifier to subsequent service requests to the server system and is serviced without further authorization.

14. A method as claimed in claim 13 wherein the session identifier includes a user identifier.

15. A method as claimed in claim 13 wherein the session identifier includes an expiration time for the session.

16. A method as claimed in claim 13 wherein the session identifier provides access to a protected domain to which the session has access authorization.

17. A method as claimed in claim 16 wherein the session identifier is modified for access to a different protected domain.

18. A method as claimed in claim 13 wherein the session identifier provides a key identifier for key management.

19. A method as claimed in claim 13 wherein the server system records information from the session identifier in a transaction log in the server system.

20. A method as claimed in claim 13 wherein the client modifies the path name of a current uniform resource locator using relative addressing and retains the session identifier portion of the path name unmodified for successive requests in the session.

21. A method as claimed in claim 1 wherein:

the server system subjects the client to an authorization routine prior to issuing the session identifier and the session identifier is protected from forgery, records information from the session identifier in a transaction log in the server system, tracks request paths relative to hypertext pages, and maintains a data base relating customer demographics to access patterns; and

the client modifies the path name of a current uniform resource locator using relative addressing and retains the session identifier portion of the path name unmodified for successive requests in a session.

22. A method of processing service requests from a client to a server system through a network, said method comprising the steps of:

appending as part of a path name in a uniform resource locator a session identifier to the request, wherein communications between the client and server system are according to hypertext transfer protocol;

responding to requests for hypertext pages received from a client through the network by returning the requested hypertext pages to the client;

responding to further client requests related to links in the hypertext pages; and tracking the further client requests related to a particular hypertext page.

23. A method as claimed in claim 22 wherein the requests include a common session identifier and the server system tracks client requests within a session of requests.

24. A method of processing service requests from a client to a server system through a network, said method comprising the steps of:

appending a session identifier to the request as part of a path name in a uniform resource locator, wherein communications between the client and server system are according to hypertext transfer protocol; and

responding to requests for documents received from the client through the network by returning the requested documents wherein the documents are customized for a particular user based on a user profile.

25. A method of processing service requests from a client to a server system through a network, said method comprising the steps of:

responding to a request for a document received from the client through the network, wherein communications between the client and server system are according to hypertext transfer protocol;

appending a session identifier, which includes a user identification to the request as part of a path name in a uniform resource locator; and

returning the requested document wherein the document is customized for a particular user based on the user identification of the session identifier.

26. A method of processing service requests from a client to a server system through a network, said method comprising the steps of:

appending a session identifier to the request as part of a path name in a uniform resource locator, wherein communications between the client and server system are according to hypertext transfer protocol;

responding to requests for information received from the client through the network by returning the requested information to the client; and

counting requests to particular information exclusive of repeated requests from a common client.

27. A method as claimed in claim **26** comprising excluding from the counting requests made for information from the client within a defined period of time.

28. A method of processing service requests for a document received from a client through a network in which the document has been purchased by a user, said method comprising the steps of:

responding to a request for a document received from a client through the network in which the document has been purchased by the user wherein communications between the client and server system are according to hypertext transfer protocol;

appending an authorization identifier to the request as part of a path name in a uniform resource locator; and

returning the requested document if the authorization identifier indicates that the user is authorized to access the document.

29. A method as claimed in claim **28**, wherein the authorization identifier is encoded within a session identifier which is appended to the request as part of a path name in a uniform resource locator.

30. A method of processing service requests from a client to a server system through a network, said method comprising the steps of:

responding to a request for a document received from a client through the network, wherein communications between the client and server system are according to hypertext transfer protocol;

appending as part of a path name in a uniform resource locator a session identifier to the request;

returning the requested document to the client, and;

charging the user identified in the session identifier for access to the document.

31. A method as claimed in claim **30**, wherein a user identifier is encoded within a session identifier which is appended to the request.

32. An information system on a network, comprising:

means for receiving service requests from clients and for determining whether a service request includes a session identifier, wherein communications between the client and server system are according to hypertext transfer protocol;

means for appending the session identifier as part of a path name in a uniform resource locator in response to an initial service request in a session of requests; and

means for servicing service requests from a client which include the session identifier, the subsequent service request being processed in the session.

33. An information system as claimed in claim **32** wherein the means for providing the session identifier is in a server system which services the requests.

34. An information system as claimed in claim **32** further comprising an authorization routine for authorizing the client prior to issuing the session identifier and means for protecting the session identifier from forgery.

35. An information server system as claimed in claim **32** further comprising a transaction log for recording information from the session identifier.

36. An information system as claimed in claim **32** further comprising means for tracking access history of sequences of service requests within the session of requests.

37. An information system as claimed in claim **32** further comprising means for counting requests to particular services exclusive of repeated requests from a common client.

38. An information system as claimed in claim **32** further comprising a data base relating customer information to access patterns.

39. An information system as claimed in claim **38** wherein the information includes customer demographics.

40. An information server on a network, comprising:

means for appending a session identifier as part of a path name in a uniform resource locator, wherein communications between the client and server system are according to hypertext transfer protocol;

means for responding to requests for hypertext pages received from a client through the network by returning the requested hypertext pages to the client;

means for responding to further requests derived from links in the hypertext pages; and means for tracking the further requests derived from a particular hypertext page.

41. A server as claimed in claim **40** wherein the requests include a common session identifier and the server tracks requests within a session of requests.

42. A server as claimed in claim **41** further comprising a data base relating customer demographics to access patterns.

43. An information server on a network, comprising:

means for appending the session identifier as part of a path name in a uniform resource locator, wherein communications between the client and server system are according to hypertext transfer protocol;

means for responding to requests for service received from a client through a network by returning the requested service to the client; and

means for counting requests to particular service exclusive of repeated requests from a common client.

44. A server as claimed in claim **43** wherein the requests include a common session identifier and the server tracks requests within a session of requests.

45. A server as claimed in claim **43** further comprising means for excluding requests made to a service from the client within a defined period of time.

* * * * *

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(12) EX PARTE REEXAMINATION CERTIFICATE (5320th)

United States Patent
Levergood et al.

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(45) Certificate Issued: Apr. 4, 2006

(54) INTERNET SERVER ACCESS CONTROL AND MONITORING SYSTEMS

(75) Inventors: Thomas Mark Levergood, Hopkinton, MA (US); Lawrence C. Stewart, Burlington, MA (US); Stephen Jeffrey Morris, Westford, MA (US); Andrew C. Payne, Lincoln, MA (US); George Winfield Treese, Newton, MA (US)

(73) Assignee: Divine Technology Ventures, Chicago, IL (US)

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(58) Field of Classification Search 709/203, 709/208, 217–219, 224–225, 227–229
See application file for complete search history.

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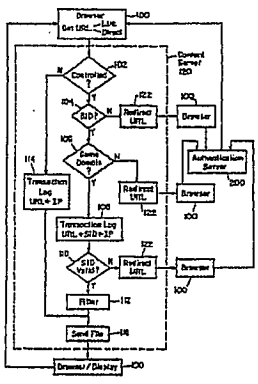
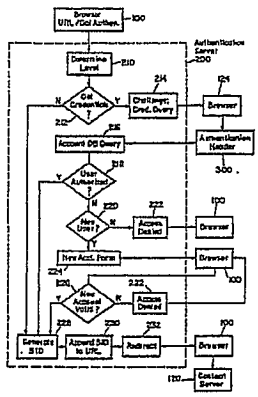
Primary Examiner—Bharat Barot

(57) ABSTRACT

This invention relates to methods for controlling and monitoring access to network servers. In particular, the process described in the invention includes client-server sessions over the Internet involving hypertext files. In the hypertext environment, a client views a document transmitted by a content server with a standard program known as the browser. Each hypertext document or page contains links to other hypertext pages which the user may select to traverse. When the user selects a link that is directed to an access-controlled file, the server subjects the request to a secondary server which determines whether the client has an authorization or valid account. Upon such verification, the user is provided with a session identification which allows the user to access to the requested file as well as any other files within the present protection domain.





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EX PARTE REEXAMINATION CERTIFICATE ISSUED UNDER 35 U.S.C. 307

THE PATENT IS HEREBY AMENDED AS INDICATED BELOW.

Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–45 is confirmed.

New claims 46–136 are added and determined to be patentable.

46. The method of claim 1, wherein the session identifier includes a key identifier.

47. The method of claim 1, wherein the session identifier includes an Internet Protocol address of the client.

48. The method of claim 1, further comprising the step of digitally signing the session identifier prior to returning it from the server to the client.

49. The method of claim 48, wherein the session identifier includes a plurality of information fields and is digitally signed by performing a hash computation on the information fields.

50. The method of claim 49, wherein the information fields of the session identifier include a user identification field and an expiration time field.

51. The method of claim 49, wherein the information fields of the session identifier include a network address field and a key identifier field.

52. The method of claim 49, wherein the information fields of the session identifier include a domain field and a network address field.

53. The method of claim 1, further comprising the steps of:

determining that the service request is from an unauthorized user of the server; and

prior to returning a session identifier to the unauthorized client,

prompting the client to become an authorized user of the server by providing access credentials, the access credentials including a user identifier and a secret key; and

validating the access credentials as the server; and

transmitting a hypertext transfer protocol REDIRECT command back to the client along with the session identifier, wherein the REDIRECT command includes a uniform resource locator having the session identifier appended thereto.

54. The method of claim 53, further comprising:

receiving the REDIRECT command at the client and processing the command using a web browser application operating at the client, the web browser application issuing a hypertext transfer protocol GET command in response to the REDIRECT command, the GET command including the uniform resource locator with the appended session identifier.

55. The method of claim 4, wherein the information recorded in the transaction log includes the network address of the client.

56. The method of claim 1, wherein the session identifier includes an access domain to which the client is authorized to gain access, the method further comprising the steps of:

generating a relative uniform resource locator link at the client, the relative uniform resource locator link including the session identifier;

transmitting the relative uniform resource locator link to the server;

determining whether the relative uniform resource locator link is pointing to a hypertext page in the same access domain as that identified in the session identifier;

if the relative uniform resource locator link is pointing to a hypertext page in the same access domain, then the server accepts the link and transmits the requested page to the client; and

if the relative uniform resource locator link is pointing to a hypertext page in a different access domain, then the server denies the link.

57. The method of claim 56, further comprising the steps of:

after denying the link, the server transmitting a hypertext transfer protocol REDIRECT command to the client, the REDIRECT command including a uniform resource locator of an authorization server.

58. The method of claim 1, further comprising the steps of:

providing a browser program at the client; and

storing one or more session identifiers at the browser program for use in transmitting subsequent service requests to the server.

59. The method of claim 1, wherein the uniform resource locator includes a transfer protocol identifier, a host name, one or more directory names, and a file name.

60. The method of claim 59, wherein the session identifier is appended to the path name in the uniform resource locator between the transfer protocol identifier and the file name.

61. The method of claim 1, wherein the server system tracks access history information within a client-server session.

62. The method of claim 61, wherein the access history information is used to charge for advertising on the server system.

63. The method of claim 62, wherein the amount to charge for advertising is based on a number of link traversals from an advertising page to a product page.

64. The method of claim 62, wherein the amount to charge for advertising is based on a count of purchases resulting from a path including an advertisement.

65. The method of claim 1, wherein the server system includes a content server and an authorization server, the content server receives the service request from the client and causes one or more client authentication parameters to be forwarded to the authorization server for authorization, the authorization server in turn returns the session identifier to the client.

66. The method of claim 65, wherein the request with the session identifier is transmitted from the client to the content server.

67. The method of claim 66, wherein the session identifier includes a plurality of information fields and a digital signature, and wherein the content server receives the request with the session identifier and compares the digital signature with a computed digital signature of the information fields in order to verify the session identifier.

68. The method of claim 65, wherein the authorization server queries a user account database and compares data

stored therein with the one or more client authentication parameters in order to authorize the client service request.

69. The method of claim 68, wherein the user account database includes a user identifier and a password.

70. The method of claim 68, wherein the user account database includes demographic information regarding the user of the client.

71. The method of claim 68, wherein the user account database includes a network address of the client.

72. The method of claim 71, wherein the network address is an Internet Protocol address.

73. The method of claim 65, further comprising the steps of:

determining that the client is not authorized to access the content server; and

the authorization server prompting the client to setup an account with the authorization server in order to become authorized to access the content server.

74. The method of claim 1, wherein the session identifier enables the client to access files within a protection domain.

75. The method of claim 74, wherein the protection domain includes a plurality of servers.

76. The method of claim 1, wherein the client is operating a web browser, and the server system is a web server, and wherein the session of requests include a plurality of hypertext transfer protocol GET requests transmitted from the client web browser to the web server, each of the GET requests including a uniform resource locator having the session identifier appended thereto.

77. The method of claim 65, wherein the content server transmits a hypertext transfer protocol REDIRECT command back to the client that causes the client to transmit the one or more client authentication parameters to the authorization server.

78. The method of claim 1, wherein the service request causes the server to transmit a document to the requesting client.

79. The method of claim 78, wherein the document is customized for the client by the server, prior to transmission, based upon the session identifier.

80. The method of claim 79, wherein the customized document is a web page, and the web page is customized based upon a user identifier encoded within the session identifier.

81. The method of claim 79, wherein the customized document is a web page, and the web page is customized based upon a user profile associated with the session identifier.

82. The method of claim 1, wherein the session identifier is provided to the client prior to or without a credential check procedure being performed between the client and the server.

83. The method of claim 82, wherein the credential check procedure includes a request for user name and password from the client.

84. The information system of claim 32, wherein the session identifier includes a user identifier.

85. The information system of claim 32, wherein the session identifier includes an expiration time for the session.

86. The information system of claim 36, further comprising means for tracking the access history to determine service requests leading to a purchase made within the session of requests.

87. The information system of claim 33, wherein the server system maintains a data base relating customer information to access patterns.

88. The information system of claim 87, wherein the information includes customer demographics.

89. The information system of claim 33, wherein the server system comprises plural servers including an authentication server which provides session identifiers for service requests to multiple servers.

90. The information system of claim 32, further comprising:

means for directing the service request to a first server which is to provide the requested service;

the first server including a means for checking the service request for a session identifier and for only servicing a service request having a valid session identifier, and where the service request has no valid identifier:

the first server redirecting the service request from the client to the authorization server;

the authorization server subjecting the client to the authorization routine and issuing the session identifier to be appended to the service request to the first server;

the client forwarding the service request appended with the session identifier to the first server; and

the first server recognizing the session identifier and servicing the service request to the client; and

the client including a means for appending the session identifier to subsequent service requests to the server system.

91. The information system of claim 90, wherein the session identifier includes a user identifier.

92. The information system of claim 90, wherein the session identifier includes an expiration time for the session.

93. The information system of claim 90, wherein the session identifier provides access to a protected domain to which the session has access authorization.

94. The information system of claim 93, further comprising a means for modifying the session identifier for access to a different protected domain.

95. The information system of claim 90, wherein the session identifier provides a key identifier for key management.

96. The information system of claim 90, wherein the server system includes a means for recording information from the session identifier in a transaction log in the server system.

97. The information system of claim 90, wherein the client includes a means for modifying the path name of a current uniform resource locator using relative addressing and for retaining the session identifier portion of the path name unmodified for successive requests in the session.

98. The information system of claim 32, wherein:

the server system subjects the client to an authorization routine prior to issuing the session identifier and the session identifier is protected from forgery, records information from the session identifier in a transaction log in the server system, tracks request paths relative to hypertext pages, and maintains a data base relating customer demographics to access patterns; and

the client modifies the path name of a current uniform resource locator using relative addressing and retains the session identifier portion of the path name unmodified for successive requests in a session.

99. The information system of claim 32, wherein the session identifier includes a key identifier.

100. The information system of claim 32, wherein the session identifier includes an Internet Protocol address of the client.

101. The information system of claim 32, further comprising means for digitally signing the session identifier prior to appending it to the uniform resource locator.

102. The information system of claim 101, wherein the session identifier includes a plurality of information fields and is digitally signed by performing a hash computation on the information fields.

103. The information system of claim 102, wherein the information fields of the session identifier include a user identification field and an expiration time field.

104. The information system of claim 102, wherein the information fields of the session identifier include a network address field and a key identifier field.

105. The information system of claim 102, wherein the information fields of the session identifier include a domain field and a network address field.

106. The information system of claim 32, further comprising:

means for determining that the service request is from an unauthorized user of the server; and

means for prompting the client to become an authorized user of the server by providing access credentials, the access credentials including a user identifier and a secret key;

means for validating the access credentials at the server; and

means for transmitting a hypertext transfer protocol REDIRECT command back to the client along with the session identifier, wherein the REDIRECT command includes a uniform resource locator having the session identifier appended thereto.

107. The information system of claim 106, further comprising:

means for receiving the REDIRECT command at the client and for processing the command using a web browser application operating at the client, the web browser application issuing a hypertext transfer porotocl GET command in response to the REDIRECT command, the GET command including the uniform resource locator with the appended session identifier.

108. The information system of claim 35, wherein the information recorded in the transaction log includes the network address of the client.

109. The information system of claim 33, wherein the session identifier includes an access domain to which the client is authorized to gain access, further comprising:

means for generating a relative uniform resource locator link at the client, the relative uniform resource locator link including the session identifier;

means for transmitting the relative uniform resource locator link to the server system;

means for determining whether the relative uniform resource locator link is pointing to a hypertext page in the same access domain as that identified in the session identifier;

means for accepting or denying the link, and if the link is accepted for transmitting the hypertext page pointed to by the link.

110. The information system of claim 109, further comprising:

means, responsive to the link being denied, for transmitting a hypertext transfer protocol REDIRECT command to the client, the REDIRECT command including a uniform resource locator of an authorization server.

111. The information system of claim 32, further comprising:

a browser program at the client; and

means for storing one or more session identifiers at the browser program for use in transmitting subsequent service requests to the system.

112. The information system of claim 32, wherein the uniform resource locator includes a transfer protocol identifier, a host name, one or more directory names, and a file name.

113. The information system of claim 112, wherein the session identifier is appended to the path name in the uniform resource locator between the transfer protocol identifier and the file name.

114. The information system of claim 33, wherein the server system tracks access history information within a client-server session.

115. The information system of claim 114, wherein the access history information is used to charge for advertising on the server system.

116. The information system of claim 115, wherein the amount to charge for advertising is based on a number of link traversals from an advertising page to a product page.

117. The information system of claim 115, wherein the amount to charge for advertising is based on a count of purchases resulting from a path including an advertisement.

118. The information system of claim 33, wherein the server system includes a content server and an authorization server, the content server including means for receiving the service request from the client and for causing one or more client authentication parameters to be forward to the authorization server for authorization, the authorization server including means for returning the session identifier to the client.

119. The information system of claim 118, wherein the request with the session identifier is transmitted from the client to the content server.

120. The information system of claim 119, wherein the session identifier includes a plurality of information fields and a digital signature, and wherein the content server receives the request with the session identifier and compares the digital signature with a computed digital signature of the information fields in order to verify the session identifier.

121. The information system of claim 118, wherein the authorization server includes a means for querying a user account database and for comparing data stored therein with the one or more client authentication parameters in order to authorize the client service request.

122. The information system of claim 121, wherein the user account database includes a user identifier and a password.

123. The information system of claim 121, wherein the user account database includes demographic information regarding the user of the client.

124. The information system of claim 121, wherein the user account database includes a network address of the client.

125. The information system of claim 124, wherein the network address is an Internet Protocol address.

126. The information system of claim 118, further comprising:

means for determining that the client is not authorized to access the content server; and

the authorization server including means for prompting the client to setup an account with the authorization server in order to become authorized to access the content server.

127. The information system of claim 32, wherein the session identifier enables the client to access files within a protection domain.

128. The information system of claim 127, wherein the protection domain includes a plurality of servers.

129. The information system of claim 33, wherein the client is operating a web browser, and the server system is

a web server, and wherein the session of requests include a plurality of hypertext transfer protocol GET requests transmitted from the client web browser to the web server, each of the GET requests including a uniform resource locator having the session identifier appended thereto.

130. The information system of claim 118, wherein the content server transmits a hypertext transfer protocol REDIRECT command back to the client that causes the client to transmit the one or more client authentication parameters to the authorization server.

131. The information system of claim 33, wherein the service request causes the server to transmit a document to the requesting client.

132. The information system of claim 131, wherein the document is customized for the client by the server, prior to transmission, based upon the session identifier.

133. The information system of claim 132, wherein the customized document is a web page, and the web page is customized based upon a user identifier encoded within the session identifier.

134. The information system of claim 132, wherein the customized document is a web page, and the web page is customized based upon a user profile associated with the session identifier.

135. The information system of claim 32, wherein the session identifier is provided to the client prior to or without a credential check procedure being performed between the client and the server.

136. The information system of claim 135, wherein the credential check procedure includes a request for user name and password from the client.

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